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River Ecosystem Restoration Initiative

Project Workplan

Habitat Restoration along the Upper Santa Fe River

Implemented by:

Santa Fe Watershed Association (SFWA)
The Nature Conservancy (TNC)
Watershed West, LLC (WW)

The Santa Fe Watershed Association and its partner organizations have received funding from the State of New Mexico's River Ecosystem Restoration Initiative (RERI) to restore a 2,300 foot stretch of the Santa Fe River channel, immediately upstream from Two Mile Pond (see Map 1). The purpose of the project is to restore the river stretch to a healthy riparian status, and enhance the functions of the Pond as a biological refuge which can benefit the rest of the river downstream. In addition to improving the channel and restoring in-stream structures (e.g., a fish ladder where the channel will traverse the Old Stone Dam), the project also includes revegetation along the restored channel. The project land area is approximately 20 acres, as indicated on Map 2. The official project start date is January 1, 2009 and the official end date is Dec. 31, 2012. The intention of the project partners is to complete the project by June 30, 2010, a duration of 18 months.

Background

In 2007 the Santa Fe River was designated as the nation's number one Most Endangered River by American Rivers, a national advocacy group. As a dry river whose waters are impounded for municipal water supply, the Santa Fe River is truly endangered. From Nichols Dam, 3 miles upstream of the historic plaza and the Roundhouse, to the Wastewater treatment plant some 8 miles downstream, the river is normally dry. Yet even so, there substantial stretches where the riparian ecosystem is still functioning, particularly upstream of the Alameda Bridge to Two Mile Pond. Upstream of Two Mile Dam to the City-owned "concrete weir" (about half way from the Pond to Nichols Reservoir), the natural river channel has been obliterated. When water is released from Nichols it is usually redirected into a diversion channel taking off just below the concrete

weir, and reconnecting to the natural river channel below Two Mile Pond. The project will reconnect Two Mile Pond to the natural river channel upstream, by constructing a 1000' stretch of channel in the sediment fill behind the Old Stone Dam and upstream to the concrete diversion weir. The river channel above the concrete diversion weir is in a fairly natural condition and is not included in the present project. Removal of the concrete diversion weir (managed by the city but located on TNC lands) is not included in the current project, but will be considered as part of a Phase 2 follow-on project.

Historical Water Use and Hydrology. Beginning with Spanish settlement in the early 17th century, records indicate that the river was typically perennial from the headwaters through the vicinity of the plaza. From there, the river would often seep into the sandy channel, re-emerging at springs downstream. Management of the river was limited to diverting it into a system of acequias that served to supply household needs as well as irrigation. According to the hydrographic survey of 1914, there were at least 38 ditches watering 1267 acres between the upper Santa Fe Canyon and La Bajada.[1]

Between 1881 and 1943, four dams were built on the Santa Fe River: The first, Stone Dam, impounded 25 acre-feet, but was filled with sediment in a single storm in 1904. Two-Mile Dam (named for its distance from the plaza) was constructed in 1893 and stored 387 acre-feet. It was decommissioned and breached in 1994 due to safety concerns. A small remnant pond [termed *Two-Mile Pond*] is contained by the remnants of the dam. The pond is fed by water conveyed by pipe from the concrete diversion weir upstream, and also by water that seeps through the sediment-filled Stone Dam.

Hydrologically, the section of the river targeted for restoration is a gaining reach. The river channel below Nichols receives a small amount of seepage below the dam, typically under 0.5 cfs. This flow is variable and small, but has contributed to groundwater storage that has sustained vegetation and wildlife in the downstream reaches. The most important tributary is Aztec Springs, which enters the canyon from the north, just below the concrete weir, halfway between Nichols Dam and Two Mile Pond. The pond has never dried up since its construction in 1994, even in drought years.

Planning Context of the Project. Restoration of the river corridor above Two Mile Pond has been discussed since the property was transferred to The Nature Conservancy in 2002. The Nature Conservancy has actively managed the land as the Santa Fe Canyon Preserve accessible to the public, with an interpretive loop trail through the project area featuring information panels on the historic dams, the watershed, and natural life within the Preserve.

The current project to restore the natural river channel above Two Mile Pond originated from planning meetings in early 2007 between the Santa Fe Watershed Association and Trout Unlimited about the potential for restoring cutthroat trout to the Santa Fe River. The premise of these discussions was that the City would soon release a year-round

[1] Grant, Paige. Jan, 2002. Santa Fe River Watershed Restoration Action Strategy. Santa Fe Watershed Association.

instream flow, which might support a native trout species adapted to low flow environments. A reconnaissance of the riparian corridor focused attention on Two Mile Pond as a promising refuge to support trout populations particular during droughts; however, the pond would need to be reconnected with the natural flow of the river. A $10,000 seed grant was obtained from the Biophilia Foundation to conduct a feasibility study of re-connecting the pond with the river. This study was completed in May 2008 and serves as the primary basis for the present project.[2]

The feasibility study suggested that the pond would need to be deepened to ensure low enough temperatures for viable trout populations. At the same time, the water politics of the City retreated from the idea of continuous flows in the river. These two factors suggested the wisdom of a scaled-down restoration initiative (i.e., the present project) which does not depend on new instream flows, but instead can be supported from the existing water that seeps, and sometimes flows, into the pond. The scope of the present project comprises Phase 1 of an anticipated larger effort.

Project Goals and Objectives

The primary purpose of the present Phase 1 project is to restore a critical ½ mile stretch of the natural river course immediately above Two Mile Pond. Through creating new riparian habitat, the ecological health of the pond will also be enhanced. This section is of particular ecological importance as it enjoys permanent water and can serve as a refuge for aquatic life. A further objective of this Phase 1 project, is to prepare the engineering groundwork and political consensus-building for additional restoration work to be taken up as a follow-on Phase 2 project. The second-phase project would restore connectivity between Two Mile Pond and the river channel downstream to the Camino Cruz Blanca bridge (near Christo Rey Church), a distance of about one mile. This is the most biologically rich stretch of the entire river upstream of the Wastewater Treatment Plant. Providing connectivity with Two Mile Pond and the Phase-1 restored channel upstream of the Pond, would importantly enhance the river's ecological potential.

Implementation Plan and Schedule

The activities outlined here will be undertaken between January 1, 2009 and June 30, 2010. Final reports for Phase 1 would be submitted by September 31, 2010.

- Task: *Obtain permits from NMED/Army Corps (401/404 Permits); prepare application and coordinate with agencies*
  Responsible Person: Neil Williams (Watershed West)
  Completion Date: March 31, 2009

[2] *Fish Habitat Restoration for Santa Fe River Between Nichols Reservoir and Two-Mile Pond: A Feasibility Study and Cost Assessment.* Prepared for the Santa Fe Watershed Association by Watershed West, May 2008. Copies of this report are available on request to the Santa Fe Watershed Association: www.santafewatershed.org.

- Task: *Conduct Topographical Survey of project area*.
  Details: A survey company will be contracted to provide a reliable map for designing the new channel and associated structures.
  Responsible Party: Neil Williams (Watershed West)
  Completion Date: April 15, 2008

- Task: *Develop engineering designs: construction plans and specifications, contract documents, and stormwater pollution prevention plan*
  Responsible Person: Neil Williams (Watershed West) and Pamela Dupzyk (SFWA)
  Completion Date: May 15, 2009

- Task: *Channel Clearing above Concrete Diversion Dam*
  Details: Debris from the river channel immediately upstream of the Concrete Diversion Dam (on TNC property) will be cleared, and intake screens installed, to reduce clogging of the intake pipes (the source of water for the restored channel).
  Responsible Person: Robert Findling (TNC)
  Completion Date: June 15, 2009

- Task: *Remove portions of the twin 12" and 14" pipes that presently convey flow from the Concrete Diversion Dam to the Stone Dam.*
  Details*:* The pipes will be cut downstream of the point where Aztec Springs arroyo crosses the pipes (about 75m below the Concrete Diversion Dam). A ca. 30' section of the pipes will be removed and will be replaced by an open channel. This will be the beginning of the ½ mile restored river channel. Most of the remaining pipes will remain in place, unless they interfere with the course of the new river channel. It is anticipated that the pipes will need to be removed where they cut through Stone Dam (since this is also where the new river channel will cut through that dam).
  Responsible Person: Neil Williams (Watershed West), and Robert Findling (TNC)
  Completion Date: July 15, 2009

- Task: *Install flow measuring gauge below outlet of Two Mile Dam.*
  Details: An existing broken measuring device below Two Mile Dam will be rehabilitated and calibrated (contingent on City consent).
  Responsible Person: Neil Williams
  Completion Date: April 30, 2010

- Task: *Channel Restoration above Stone Dam:*
  Details: The core task of the restoration project will be the construction of a new river channel to replace the pipe conveyance from below the Concrete Diversion Dam to Stone Dam, a distance of ca. 1,000'. The excavated channel will be designed for a maximum capacity of 12 cusecs. The excavated material will be placed on-site, on Nature Conservancy lands. In addition to excavation of the channel, restoration features such as log and boulder obstacles to create riffles and pools, will also be constructed. Details will be defined in the engineering designs.
  Responsible Person: Neil Williams (Watershed West)
  Completion Date: November 15, 2009

- Task: *Revegetation along the new river channel:*
  Details: The construction of the new river channel will offer an opportunity for restoring native shrubs and trees (cottonwoods, willows), which will serve to stabilize the river banks, while providing habitat. A particular concern for aquatic restoration is vegetative shading to moderate the water temperature.
  Responsible Person: Robert Findling (TNC) and Pamela Dupzyk (SFWA)
  Completion Date: November 15, 2009

- Task*: Construct Stone Dam Drop Structure.*
  Details: The anticipated level of the restored channel where it cuts through Stone Dam will be about 10' above the downstream reach and will require a drop structure which can also function as a fish ladder. This structure will be built with materials on site (boulder debris below Stone Dam) and with some imported boulders. In addition to its dual function of drop structure and fish ladder, the structure will also help to stabilize the dam.
  Responsible Person: Neil Williams (Watershed West)
  Completion Date: November 15, 2009

- Task: *Preliminary Design of Phase 2 Restoration Elements*
  Details: As both an input to stakeholder consultations, and as an output of those discussions, Phase 2 restoration elements will be defined. Preliminary design drawings will incorporate inputs from major stakeholders, including Audubon Society, Canyon Neighborhood Association, the City of Santa Fe, and other groups, as well as inputs from expert reviewers.
  Responsible Persons: Neil Williams, Robert Findling, David Groenfeldt, and Pamela Dupzyk.
  Completion Date: April 30, 2010

- Task: *Monitoring and Evaluation*
  Details: (to be defined)
  Responsible Person: David Groenfeldt and Pamela Dupzyk (SFWA)
  Completion Date: June 30, 2010